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# The Function of Polycomb Repressive Complex 2 (PRC2) In Plant Retrograde Signaling Pathway

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**Abstract :** In Arabidopsis thaliana, histone 3 lysine 27 tri-methylation catalysed byPRC2 is playing essential functions in the regulation of plant development, growth, and reproduction[1-2]. Despite numerous studies related to the role of PRC2 in developmental control, how PRC2 works in the operational control in plants is unknown. In the present, the evidence that PRC2 probably participates in the regulation of retrograde singalling pathway in Arabidopsisis found. Firstly, we observed that the rosette size and biomass in PRC2-depletion mutants (clf-29 and swn-3) is significantly higher than WTunder medium light condition (ML: 125 µmol $m^{-2}$ $s^{-2}$), while under medium high light condition (MHL: 300 µmol $m^{-2}$ s-2), the increase was reverse. Under ML condition, the photosynthesis related parameters determined by fluorCam did not show significant differences between WT and mutants, while the pigments concentration increased in the leaf of PRC2-depletion mutants, especially in swn. The dynamic of light-responsive genes and circadian clock genes expression by RT-qPCRwithin 24 hours in the mutants were comparable to WT. However, we observed upregulation of photosynthesis-associated nuclear genes in the PRC2-depletion mutants under chloroplast damaging condition (treated by lincomycin), corresponding to the so-called genome uncoupled (gun) phenotype. Here, we will present our results describing these phenotypes and our suggestion and outlook for studying the involvement of PRC2 in chloroplast-to-nucleus retrograde signalling.

**Keywords :** PRC2, retrograde signalling, light acclimation, photosyntheis
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